

A rice based diet with green banana or pectin reduced diarrhoea in infants better than a rice alone diet

Rabbani GH, Teka T, Zaman B, et al. *Clinical studies in persistent diarrhea: dietary management with green banana or pectin in Bangladeshi children*. *Gastroenterology* 2001 Sep;121:554–60.

QUESTION: In Bangladeshi infants with persistent diarrhoea, is a rice based diet with green banana or pectin more effective than a rice alone diet in reducing diarrhoea?

Design

7 day randomised [allocation concealed*]†, blinded (clinicians, patients, outcome assessors, and statisticians),* controlled trial.

Setting

International Centre for Diarrhoeal Disease Research in Dhaka, Bangladesh.

Patients

62 boys who were 5 to 12 months of age (mean age 8.7 mo) with a history of loose stools (> 3/d) for ≥ 14 consecutive days; absence of concurrent illness, severe infection, or severe malnutrition; no receipt of antimicrobial or antidiarrhoeal agents within 7 days; and ability to take oral feed. All patients completed the study.

Intervention

Patients were allocated to a rice based banana (250 g/l of cooked, green bananas) (n=22), rice based pectin (Sigma, St. Louis, MO, USA) (4 g/kg of body weight) (n=19), or rice alone diet (n=21) for 7 days. All 3 diets were given in bottles, and children were fed freely by their mothers. The diets were flavoured with vanilla, strawberry, or lemon to prevent observer bias.

Main outcome measures

The primary outcome was recovery from diarrhoea (formed stool). Secondary outcomes were need for oral rehydration solution (ORS), need for intravenous (IV) fluid, stool frequency, vomiting, and duration of diarrhoea.

Main results

More patients who received banana or pectin had formed stools than did patients who received the rice alone diet. The difference was seen by day 3 and was sustained to the end of treatment (day 3 and 4 data are in the table). The need for ORS or IV fluids was less in the banana and pectin groups than in the rice alone group (p < 0.05). Patients who received banana or pectin also had greater reduction in stool frequency and weight, vomiting, and duration of diarrhoea than did patients who received the rice alone diet (table). The banana and pectin groups did not differ for any outcomes.

Conclusion

In Bangladeshi infants with persistent diarrhoea, a rice based diet containing green banana or pectin improved stool consistency and reduced the duration of diarrhoea more than did a rice alone diet.

*See glossary

†Information provided by author.

Rice based banana or pectin or rice alone diet for young, Bangladeshi children with persistent diarrhoea

Outcomes	Follow up	Banana	Pectin	Rice alone	p Value (banana or pectin v rice alone)
Proportion with formed stool	Day 3	59%	55%	15%	< 0.001
	Day 4	82%	78%	23%	< 0.001
Mean number of stools/day	Day 7	2.0	3.0	6.0	< 0.05
Mean number of vomiting episodes/day	Day 7	3.6	2.9	7.0	< 0.05
Time to develop formed stool (d)	—	4.0	4.2	8.9	< 0.05

COMMENTARY

Acute diarrhoeal illness claims the lives of 3 million children annually, and persistent diarrhoea is an important cause of death in malnourished infants. ORS is effective in reducing mortality, but it does not reduce the volume or duration of diarrhoea, which decreases its acceptance among caregivers. A recent meta-analysis showed that ORS containing cooked rice powder instead of glucose substantially reduces the rate of stool loss in cholera but not in non-cholera diarrhoeal illness.¹ The addition of indigestible (amylase-resistant) starches, which are poorly absorbed in the small intestine but converted to short chain fatty acids in the colon (where they aid in the reabsorption of salt and water), is something new. Ramakrishna *et al*² recently showed that indigestible starch (from maize) added to ORS reduced diarrhoea in adolescents and adults with cholera.

The small trial by Rabbani *et al* shows that pectin based and green banana based indigestible starch are similarly effective in reducing diarrhoeal stools and duration of illness in infants with persistent diarrhoea caused by various pathogens. The efficacy of indigestible starch in acute, non-cholera diarrhoea has not yet been studied, and persistent diarrhoea is uncommon. However, this treatment could constitute an important advance for young children with persistent diarrhoea in less developed countries in which mortality from this disorder is high. A locally prepared, inexpensive, and safe way to reduce the volume of stools is badly needed and could complement ORS as a lifesaving intervention for millions of children and adults with diarrhoea.

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- 1 Fontaine O, Gore SM, Pierce NF. Rice-based oral rehydration solution for treating diarrhoea. *Cochrane Database Syst Rev* 2001;(4):CD001264.
- 2 Ramakrishna BS, Venkataraman S, Srinivasan P, et al. Amylase-resistant starch plus oral rehydration solution for cholera. *N Engl J Med* 2000;342:308–13.